

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Terance William MEAD

Date: December 19, 2001

Serial No.:

Group Art Unit:

Filed:

Examiner:

For: SYSTEM FOR REDUCING SCRATCH VISIBILITY

U.S. Patent and Trademark Office  
P.O. Box 2327  
Arlington, VA 22202

**AMENDMENT/SUBMISSION**

Prior to examination, please amend the application as follows.

**FEE CALCULATION**

Any additional fee required has been calculated as follows:

  X   If checked, "Small Entity" status is claimed.

	NO. CLAIMS AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR		EXTRA PRESENT		RATE	ADDIT. FEE
TOTAL	99	MINUS	20	* =	79	X	(\$9 SE or \$18)	\$ 711.00
INDEP.	2	MINUS	3	** =	0	X	(\$42 SE or \$84)	\$
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM						X	(\$140 SE or \$280)	\$
* not less than 20 ** not less than 3								TOTAL \$ 711.00

If any additional payment is required, a check which includes the calculated fee of \$711.00 (OFGS Check No. 7788) is attached.

In the event the actual fee is greater than the payment submitted or is inadvertently not enclosed or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge the underpayment to Deposit Account No. 15-0700.

## CONTINGENT EXTENSION REQUEST

If this communication is filed after the shortened statutory time period had elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 C.F.R. § 1.136(a), to extend the time for filing a response to the outstanding Office Action by the number of months which will avoid abandonment under 37 C.F.R. § 1.135. The fee under 37 C.F.R. § 1.17 should be charged to our Deposit Account No. 15-0700.

## AMENDMENTS

☒ If checked, amendment(s) to the specification and/or claims are submitted herewith.

1. ☐ If checked, an abstract is submitted as the last page of Appendix A.

### 2. Specification:

Please delete the paragraph(s)/section(s) beginning at page, \_\_\_\_\_ and replace such paragraph(s)/section(s) pursuant to 37 C.F.R. § 1.121(b)(ii) with the "clean" version attached hereto as Appendix A. Entry is respectfully requested. A version with markings to show the changes made pursuant to 37 C.F.R. § 1.121(b)(iii) is attached hereto as Appendix B.

### 3. Claims:

Please cancel claim 33 without prejudice.

Please amend claims 1, 3, 5-7, 9, 10, 12, 13, 16, 19, 21-23, 25, 26, 29 and 32 pursuant to 37 C.F.R. § 1.121(c)(i) as set forth in the "clean" version attached hereto as Appendix A. Entry is respectfully requested. A version with markings to show the changes made pursuant to 37 C.F.R. § 1.121(c)(ii) is attached hereto as Appendix B.

☐ If checked, the optional complete set of "clean" claims pursuant to 37 C.F.R. § 1.121(c)(3) is attached hereto as Appendix C.

## REMARKS/ARGUMENT

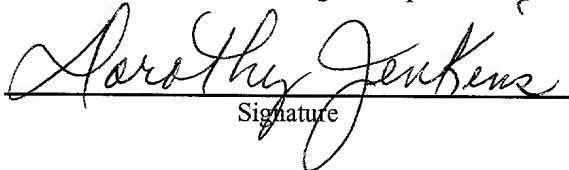
This Preliminary Amendment is being submitted to change the multiple dependent claims to single dependent claims in order to eliminate the improper multiple dependent claims and to reduce the government filing fee.

### EXPRESS MAIL CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail to Addressee (mail label # EL924389369US) in an envelope addressed to: U.S. Patent and Trademark Office, P.O. Box 2327, Arlington, VA 22202 on December 19, 2001:

Dorothy Jenkins

Name of Person Mailing Correspondence

  
Signature

December 19, 2001

Date of Signature

Respectfully submitted,



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**APPENDIX A**  
**“CLEAN” VERSION OF EACH PARAGRAPH/SECTION/CLAIM**  
**37 C.F.R. § 1.121(b)(ii) AND (c)(i)**

**CLAIMS (with indication of amended or new):**

(Amended) 1. A film scanner for converting images on film into electrical signals, comprising:

- a light source for scanning film;
- collection optics arranged to image light transmitted by the film through an imaged light path;
- one or more image light sensors arranged to receive the light from the collection optics through the imaged-light path and to produce one or more image signals representative of an image on the film;
- a reflector arrangement defining an internally reflective cavity and having at least one entrance aperture for receiving light transmitted by the film and one exit aperture for passing light to the one or more image light detectors and arranged to surround at least a portion of the imaged-light path;
- a scattered light sensor arranged in relation to the reflector arrangement to receive light which has been transmitted through the film but scattered by the film from the imaged-light path and reflected within the internally reflective cavity to produce a scattered light signal representative of the scattered light; and
- processing circuitry configured to receive the one or more image signals and the scattered light signal and having functionality to compensate the one or more image signals with reference to the scattered light signal.

(Amended) 3. A film scanner according to any one of claims 1 or 2, wherein the reflector arrangement includes a light collection lens system.

(Amended) 5. A film scanner according to claim 3, wherein the light collection lens system comprises a second lens after the exit aperture.

(Amended) 6. A film scanner according to claim 3, further comprising a scanning lens for imaging the light source onto film, wherein the light collection lens system comprises a first

lens near the entrance aperture and wherein the exit aperture is circular and has a diameter substantially equal to the diameter of the image of the scanning lens formed by the first lens.

(Amended) 7. A film scanner according to claim 1, wherein the scattered light sensor is arranged to receive scattered light through a further exit aperture of the reflector arrangement.

(Amended) 9. A film scanner according to claim 1, wherein the processing circuitry includes a summing unit for summing a function of the scattered light signal with each of the one or more image signals.

(Amended) 10. A film scanner according to claim 1, wherein the one or more image signals are three image signals each representing respectively red, green and blue light, and wherein the collection optics are arranged to image light onto respective red, green and blue image light sensors via colour splitting optics.

(Amended) 12. A film scanner according to any one of claims 10 or 11, wherein the function is:

$$(\text{Scratch signal} \times k \times \text{colour}) / (a \times \text{red} + b \times \text{green} + c \times \text{blue})$$

where: "scratch signal" is the scattered light signal

"k" is a variable constant

"Colour" is the relevant colour image signal

"Red, green, blue" are the colour image signals

"a, b, c" are constants.

(Amended) 13. A film scanner according to any one of claims 9, 10, or 11, wherein the processing circuitry includes a correction unit for correcting the scattered light signal for variations in the brightness of the light source.

(Amended) 16. A film scanner according to claim 1, wherein the reflector arrangement is arranged between the film and subsequent light splitting and collection optics.

(Amended) 19. A light collection system according to any one of claims 17 or 18, wherein the reflector arrangement includes a light collection lens system.

(Amended) 21. A light collection system according to claim 19, wherein the light collection lens system comprises a second lens after the exit aperture.

(Amended) 22. A light collection system according to claim 21, in which the film scanner has a scanning lens for imaging the light source onto film, wherein the light collection lens system comprises a first lens near the entrance aperture and wherein the exit aperture is circular and has a diameter of the image of the scanning lens formed by the first lens.

(Amended) 23. A light collection system according to any one of claims 17, 18, 19 or 20, wherein the scattered light detector is arranged to receive scattered light through a further exit aperture of the reflector arrangement.

(Amended) 25. A light collection system according to any one of claims 17, 18, 19 or 20, wherein the processing circuitry includes a summing unit for summing a function of the scattered light signal with each of the one or more image signals.

(Amended) 26. A light collection system according to any one of claims 17, 18, 19 or 20, wherein the one or more image signals are three image signals each representing red, green and blue light, and wherein the collection optics are arranged to image light onto respective red, green and blue image light sensors via colour splitting optics.

(Amended) 29. A light collection system according to claim 26, wherein the processing circuitry includes a correction unit for correcting the scattered light signal for variations in the brightness of the light source.

(Amended) 32. A telecine comprising a film scanner according to any one of claims 1, 2, 7, 8, 9, 10, 11 or 16.

**APPENDIX B**  
**VERSION WITH MARKINGS TO SHOW CHANGES MADE**  
**37 C.F.R. § 1.121(b)(iii) AND (c)(ii)**

**CLAIMS:**

1. A film scanner for converting [between] images on film [and] into electrical signals, comprising:

- a light source for scanning film;
- collection optics arranged to image light transmitted by the film through an imaged light path;
- one or more image light sensors arranged to receive the light from the collection optics through the imaged-light path and to produce one or more image signals representative of an image on the film;
- a reflector arrangement defining an internally reflective cavity and having at least one entrance aperture for receiving light transmitted by the film and one exit aperture for passing light to the one or more image light detectors and arranged to surround at least a portion of the imaged-light path;
- a scattered light sensor arranged in relation to the reflector arrangement to receive light which has been transmitted through the film but scattered by the film from the imaged-light path and reflected within the internally reflective cavity to produce a scattered light signal representative of the scattered light; and
- processing circuitry configured to receive the one or more image signals and the scattered light signal and having functionality to compensate the one or more image signals with reference to the scattered light signal.

3. A film scanner according to any one of [claim] claims 1 or 2, wherein the reflector arrangement includes a light collection lens system.

5. A film scanner according to claim 3 [or 4], wherein the light collection lens system comprises a second lens after the exit aperture.

6. A film scanner according to claim 3, [4 or 5,] further comprising a scanning lens for imaging the light source onto film, wherein the light collection lens system comprises a first lens

near the entrance aperture and wherein the exit aperture is circular and has a diameter substantially equal to the diameter of the image of the scanning lens formed by the first lens.

7. A film scanner according to [any preceding] claim 1, wherein the scattered light [detector] sensor is arranged to receive scattered light through a further exit aperture of the reflector arrangement.

9. A film scanner according to [any preceding] claim 1, wherein the processing circuitry includes a summing unit for summing a function of the scattered light signal with each of the one or more image signals.

10. A film scanner according to [any preceding] claim 1, wherein the one or more image signals are three image signals each representing respectively red, green and blue light, and wherein the collection optics are arranged to image light onto respective red, green and blue image light sensors via colour splitting optics.

12. A film scanner according to any one of [claim] claims 10 or 11, wherein the function is:

$$(\text{Scratch signal} \times k \times \text{colour}) / (a \times \text{red} + b \times \text{green} + c \times \text{blue})$$

where: "scratch signal" is the scattered light signal

"k" is a variable constant

"Colour" is the relevant colour image signal

"Red, green, blue" are the colour image signals

"a, b, c" are constants.

13. A film scanner according to any one of [claim] claims 9, 10, or [12] 11, wherein the processing circuitry includes a correction unit for correcting the scattered light signal for variations in the brightness of the light source.

16. A film scanner according to [any preceding] claim 1, wherein the [the] reflector arrangement is arranged between the film and subsequent light splitting and collection optics.



19. A light collection system according to any one of [claim] claims 17 or 18, wherein the reflector arrangement includes a light collection lens system.

21. A light collection system according to claim 19 [or 20], wherein the light collection lens system comprises a second lens after the exit aperture.

22. A light collection system according to claim [19, 20 or] 21, in which the film scanner has a scanning lens for imaging the light source onto film, wherein the light collection lens system comprises a first lens near the entrance aperture and wherein the exit aperture is circular and has a diameter of the image of the scanning lens formed by the first lens.

23. A light collection system according to any one of [claim] claims 17, 18, 19 or 20 [to 22], wherein the scattered light detector is arranged to receive scattered light through a further exit aperture of the reflector arrangement.

25. A light collection system according to any one of claims 17, 18, 19 or 20 [to 24], wherein the processing circuitry includes a summing unit for summing a function of the scattered light signal with each of the one or more image signals.

26. A light collection system according to any one of claims 17, 18, 19 or 20 [16 to 24], wherein the one or more image signals are three image signals each representing red, green and blue light, and wherein the collection optics are arranged to image light onto respective red, green and blue image light sensors via colour splitting optics.

29. A light collection system according to claim 26[, 27 or 28], wherein the processing circuitry includes a correction unit for correcting the scattered light signal for variations in the brightness of the light source.

32. A telecine comprising a film scanner according to any one of claims 1, 2, 7, 8, 9, 10, 11 or [to] 16.